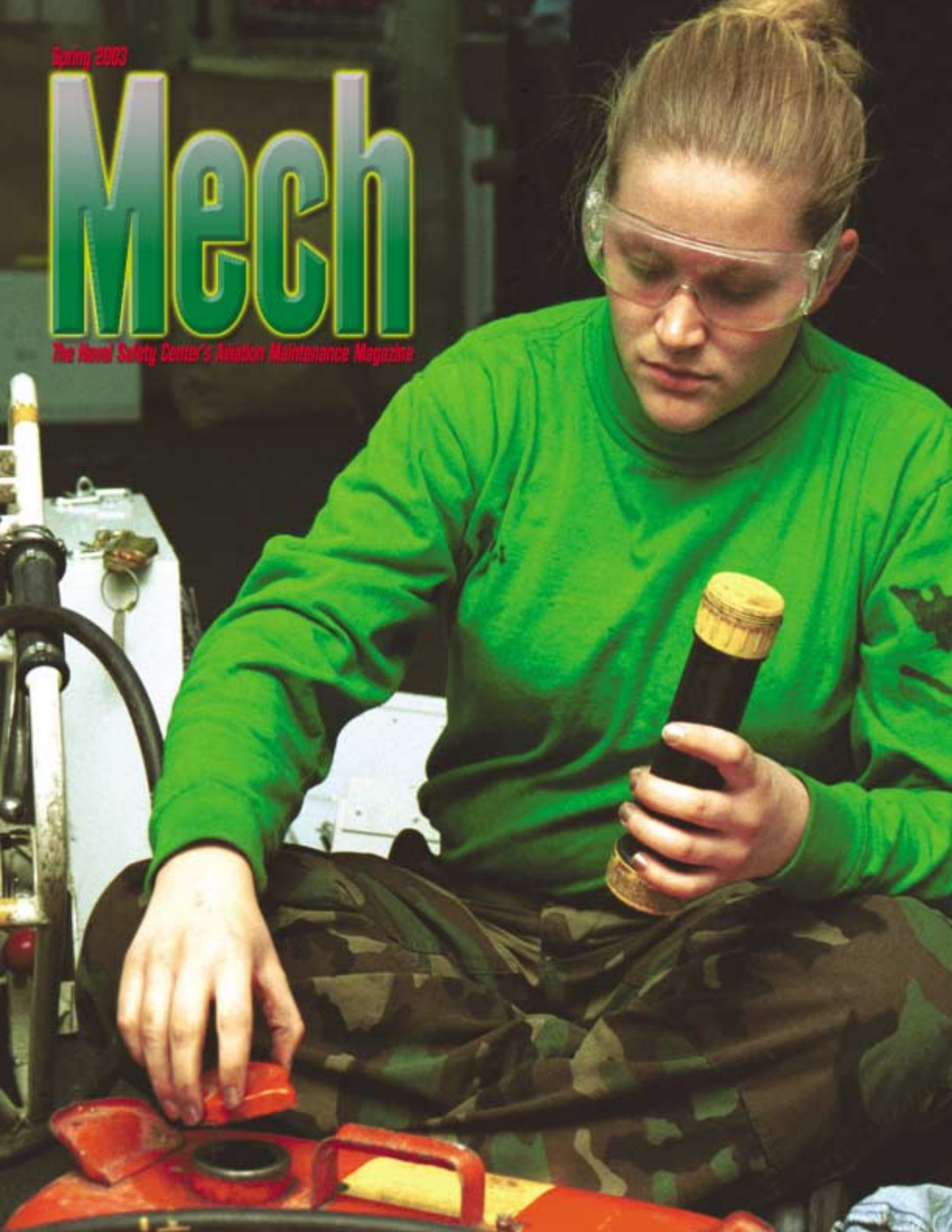


Spring 2003

# Mech

*The Naval Safety Center's Aviation Maintenance Magazine*



# Mech

## On the Cover:

Aviation Support Equipment Technician 2nd Class Heidi Thomas troubleshoots equipment aboard USS *Theodore Roosevelt*. Photo by PH3 Brandi Dalton

## Vol. 42, No. 2 Spring 2003

RDML Stephen Turcotte, Commander, Naval Safety Center  
Col. David A. Kerrick, Deputy Commander  
Derek Nelson, Head, Media Department  
Naval Safety Center (757) 444-3520 (DSN 564)  
Dial the following extensions any time during the greeting

You can e-mail any staff member by using their first name.last name@navy.mil, except as noted.

### Mech Staff

Danny Steber, Editor	7247
John Williams, Illustrator	7250
John.W.Williams1@navy.mil	
Matthew Thomas, Staff Photographer	7244
Matthew.J.Thomas1@navy.mil	
Virginia Rives, Distribution	7256
Publication FAX	(757) 444-6791

### Aircraft Maintenance & Material Division

Cdr. Allen Stephens, Division Head	7265
Capt. Mark Stiffler, USMC, Assistant Division Head	7223

### Airframe/Powerplant Branch

CWO3 Thomas Gaine, Branch Head	7293
AFCM(AW) Lynne Connor, LCPO	7220
AMCS(AW) Steven Novak, Maintenance Analyst	7221
ADCS(AW) Timothy B. Davis, Maintenance Analyst	7218
timothy.b.davis@navy.mil	
AMC(AW) Michael Malley, Maintenance Analyst	7287
AMCS(AW) Kenneth Jackson, Maintenance Analyst	7219
AMCS(AW) Carl Whatley, Maintenance Analyst/MMP Coord.	7224

### Support Equipment

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ATCS(AW/SW) Dave Clark, Maintenance Analyst	7290
david.d.clark@navy.mil	

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Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is dangerous and demanding enough. The time to learn to do a job right is before combat starts.

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Rushing to get many jobs done, this CDI misses an important step and leaves an aircraft with a temporary strut.

AE2(AW) Edward Burden

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# One Flick



*By AE1(AW) John Ezell*

**I**t had been a good night: not too much maintenance and no pressing issues. The maintenance-control chief even had considered an early secure for a few shops. That mood changed when a shipmate escorted one of our linemen, an AT3, into the hangar.

The petty officer's face was burned like a crispy critter. His skin was solid red from ear to ear and from forehead to chin. The facts behind this incident were amazing.

The AT3 maintainer was with an AEAN—a fellow lineman. They were tying down a P-3 when an NC-10 power unit suddenly stopped running. The AT3 didn't have a flashlight, so he asked his partner for a cigarette lighter. The AEAN handed over his lighter—a sign of true friendship—and offered a warning about fuel vapors. The AT3 walked over to the power cart to check the fuel level, shrugged off the advice, and flicked the Bic.

The NC-10's fuel tank was one-quarter full, leaving warm fuel vapor in the rest of the tank. When the petty officer removed that fuel cap and lit that lighter,

the vapor erupted in a burst of flame. The AT3's head, face, hands, and arms were ablaze in seconds. He then turned and walked toward the hangar. Even though the flash fire lasted only a few seconds, the young man was evacuated by helo to a hospital with a burn unit.

He is recovering well, and his doctors say he shouldn't have any scars. The cause of this mishap is obvious, but it still presents a problem we all must face.

I'm the command safety petty officer for a 500-person squadron with multiple detachment sites around the world, and it's very challenging to build and maintain safety awareness. We have message traffic, magazines, stand-downs, newsletters, and a host of other items to warn Sailors of various hazards. But it's incumbent on each individual to possess a degree of self-awareness.

Many readers probably are asking themselves, "Why did that maintainer light that flame?" I can't explain it. I have been in the Navy almost 22 years and have looked into many fuel tanks. Most maintainers know power units come with a fuel-quantity gauge, but no one trusts this device. Most people also know that gas and flame don't mix, which is why we use explosion-proof flashlights around hazardous materi-



als. A few readers probably wondered why the AEAN had a cigarette lighter—a FOD hazard—on the flight line. I believe the answer can be summed up as “permissive complacency.”

Sailors often cut corners, take chances, become inattentive, fall asleep in class, drive drunk, ignore their supervisor, get in a hurry, resist learning, and use countless other excuses to avoid doing a job by the book. It would be easy to say this petty officer just was stupid. I’d have a hard time disagreeing, but that would be the easy way out. I own some responsibility for this incident, as do our shop supervisors. Leaders set the tone in a squadron. Someone has to stand up and say, “Shortcuts, risky behavior, and shoddy work will not happen in my squadron.” If we don’t set high standards and enforce rules, these types of stupid incidents will continue.

Our leadership discussed this and other mishaps or incidents. We came up with six key components to help solve the problems discussed in this article:

- We need to increase khaki presence and leadership. This effort, commonly called MBWA (management by walking around), is our main tool to defeat lax attitudes and shortcuts, which are two primary causes of ground incidents. Implementing a safety observer program for the hangar and flight line will help. This approach requires an E-6, or above, observer with advanced maintenance-control skills to monitor critical operations (e.g. aircraft moves in and out of the hangar, man-on-the-stand turns, pack-out operations, or many other tasks). This program isn’t easy to do, but the alternative is worse.

- We make practical use of ORM—based on a Delta Airlines program that attempts to reduce incidents through standardized aircraft moves and maintenance tasks. Several squadrons already have implemented this technique, which includes checklists for everyday jobs [visit the Naval Safety Center’s maintenance website at [www.safetycenter.navy.mil/aviation/maintenance/ormchecklist.htm](http://www.safetycenter.navy.mil/aviation/maintenance/ormchecklist.htm) for examples of standardized checklists.—Ed.] This effort requires everyone to gather for a quick but thorough brief. Delta calls it “the huddle,” and it is like our QA functional-check-flight brief.

- We often read hazard reports or *Mech* articles about maintenance errors that occurred because of a lack of teamwork and communication. Our team highly recommends implementing a ground-crew-coordination training program [visit our GCT websites

He is recovering well, and his doctors say he shouldn’t have any permanent scars. The cause of this mishap is obvious, but it still presents a problem we all must face.

at [www.safetycenter.navy.mil/presentations/aviation/heavygct.htm](http://www.safetycenter.navy.mil/presentations/aviation/heavygct.htm) [heloggct.htm](http://www.safetycenter.navy.mil/presentations/aviation/heloggct.htm) or [tacairgct.htm](http://www.safetycenter.navy.mil/presentations/aviation/tacairgct.htm).—Ed.], which we now require at check in and then annually. This effort will take time to integrate into our culture, but we must implement it and must protect those training days.

- We believe in 360-degree involvement. The Navy has released several messages stating the need for human-factors councils for maintainers, and this step may help. A few squadrons with multiple detachments assign an aviation safety officer to each aircrew team or detachment. It may be tough to get formal schooling for more than one or two officers per squadron, but in-house training can “grow” others. Dr. Scott Geller in his book, “Working Safe,” says the three “E’s” necessary to improve an organization’s safety culture are ergonomics, empowerment, and evaluation. Ergonomics is the means and processes we use to do our work, and how the human body interacts with those processes and equipment. Empowerment involves a grass-roots review of our procedures, resulting in great ideas from Sailors. Evaluation occurs through frequent QA audits, safety department involvement, and enthusiastic khaki

Burned from forehead to chin



and from cheek to cheek,




a Sailor learns fuel and flame don't mix.



engagement. Correcting unsafe behavior on the spot is a critical step. Some people don't like peer or superior critiques, but this command-directed approach is necessary to combat personal error, to protect our aircraft, and to save lives.

- We think "intrusive leadership" is one way to stay connected with junior Sailors. This approach shows that leaders care about their welfare, particularly on weekends and holidays. We also have instituted a mentor program, in which junior personnel (E-1 through E-3 and some E-4s) are paired with petty officers who speak with them each weekend day. They talk about the junior Sailor's plans for the weekend: social, travel, and professional. They also discuss possible problems with stress. The mentor program isn't intended to and doesn't invade our people's privacy or personal liberty time because the junior Sailors voluntarily cooperate. Simply stated, "Intrusive leadership means getting involved in the crew's lives—on and off the job."

- Improving the total safety culture is our overall goal. We have to face up to the never-ending battle against complacency and human error. We must take care of issues inside our "lifelines" through concerned leadership and a willingness to listen to our Sailors.

We had an active safety program before this incident, but our maintainer's injury has shown us that we need to fine tune a few items. 

Petty Officer Ezell is the safety petty officer at VQ-2.

*Petty Officer Ezell echoes the sentiment that my maintenance department has expressed for more than a year. ORM, GCT and HFIM set the standards that maintainers should follow, and those programs are stressed every time we interact with the fleet. I commend VQ-2's approach in solving these problems and hope only that other activities do the same, before they have their own Bic story.—Cdr. Al Stephens, Naval Safety Center maintenance officer.*



For more info...

The quote on "intrusive leadership" came from the summer 2001 issue of *Ashore* (available at [www.safetycenter.navy.mil/media/ashore/default.htm](http://www.safetycenter.navy.mil/media/ashore/default.htm)). In that issue, a ship's CO and safety officer shared their thoughts and recommendations to reduce personal injuries and deaths, specifically from PMV mishaps.

# Attack of the Killer Huffer


*By AEC Donald English*

**I**t was a clear and brisk January morning in Atsugi, Japan. I was the QAR for the morning launch and was looking for hazards and violators. On this particular morning, the launch was going without a hitch: The checks went well, and everyone was being safe. The aircraft finished final checks, taxied from the ramp toward the taxiway and proceeded to ruin my day.

Out of habit, I grabbed the halon bottle to move it out of the jet blast as the plane turned. I passed behind a GTC-85 huffer unit that was parked next to another aircraft on our flight line. I parked the halon bottle and moved toward the hangar. The jet blast from the taxiing jet suddenly blew the top cover off the huffer unit and into my back! It was a good thump, but I was fortunate because the flat side of the cover hit me. I didn't suffer a major injury, although it rattled my nerves.

I would not have been so lucky had the edge of that panel hit me. The huffer's cover is a steel panel, approximately 3-feet high by 4-feet wide, and is secured with one-quarter-turn dzus fasteners. I don't know why the cover wasn't secured, but it isn't something squadron personnel have any reason to open. The pre-op cards do say to check cover integrity, so I guess we own some fault.

I did learn a few lessons: Everything may appear safe, but don't let down your guard. Always be alert, and expect the unexpected—no matter how long you've been in the business. Never turn your back on an aircraft while the engines are running. Make sure the SE pre-op inspections are done before putting any SE on the flight line.

Any of these steps likely would have prevented the huffer from getting the better of me that morning. 

Chief English is the maintenance-control chief at VAQ-136.

# The NAM I Could Do Without



Putting a Z-kink in a fuel hose will stop the flow.


By AMC(AW) Ward Toner

It was a typical day on board USS *Harry S. Truman* (CVN 75). We were conducting cyclic ops and trying to deal with 100s: the temperature, humidity and days to the next port visit. I was on Zapper 500, the “Electric Fat Kid,” and it just had been taxied into a spot on the forward half of elevator 2. I had called my trusty CAG rep in flight-deck control and requested a grape for a hot refuel on my jet. I didn’t realize it then, but the flight deck was going to get even hotter before the next launch.

Our plane captain secured the starboard engine to prepare for the fuel hose. He dutifully reminded the purpleshirts to stay aft of the boarding ladders when routing the fuel hose—an important precaution in case a fuel hose ruptures. About this time, things got interesting because a Tomcat just had taxied into the spot forward of my Prowler. Its exhaust raised the temperature to an almost unbearable level.

My airframe troubleshooter then pointed out a problem on the nosewheel shimmy dampener and asked me to investigate. My attention now was diverted from the hot-refueling task. The grapes struggled with the fuel hose but eventually were able to hook up. Another Zapper plane captain signaled for the purpleshirt to start fueling, and pressure soon began to build in the fuel hose. A noticeable kink formed in the line and rapidly moved along the hose to the fitting that was attached to the aircraft.

This kink caused the hose to rupture and to separate completely from the fitting. Fuel sprayed into the air and all over the deck, soaking the airframe troubleshooter, plane captain, and me. Realizing immediately the wet soggy feeling was not sweat and the ever-expanding pool beneath me was not water, I scrambled to the port side of the aircraft. I signaled frantically for an emergency shutdown and for the aircrew to exit the aircraft.

In my haste to avoid becoming another flight-deck statistic, I failed to notice the heroic and quick response from my trusty flight deck crew: AD2 Dan Cowan, AT3 Kyle Mahaffey, AO3 Yara Quintana, and AN Nino Noriega. When the hose ruptured, Petty Officer Quintana grabbed the end of the hose and covered it to keep the fuel away from the aircraft. Meanwhile, Petty Officers Cowan and Mahaffey skillfully applied a “Z” kink in the fuel hose, reducing the spray. Airman Noriega quickly removed the hose fitting from the ground refueling port, preventing fuel from draining out of the aircraft. Their quick and decisive headwork prevented fuel from going down the Prowler’s port intake and starting a fire. 

Chief Toner is a flight-deck coordinator at VAQ-130.

This flight-deck crew knew how to handle a sudden emergency.



# How I Got a Red Fa

Photograph by PH2 Micheal D. P. Flynn



A "red leg" takes the place of a strut that isn't available.

*By AE2(AW) Edward Burden*

**I**t was a day like any other. I awoke early, so I could get to work by 0630. That plan would give me time to make sure I did a thorough ATAF and would allow me to read the night-check passdown. That plan didn't prepare me for the excitement I would face before the day was out.

I went to my squadron's 0700 maintenance meeting. Once there, a maintenance-control chief told us several of our jets would fly cross-country missions over the weekend, returning on Sunday. As the leading petty officer for the troubleshooter workcenter and being a qualified FA-18 troubleshooter, my duty was to make sure all aircraft on the flight schedule were serviced and ready for the day's events.

With that thought in mind, I began my daily inspection of all aircraft to be flown. After I had inspected two aircraft, the maintenance senior chief told me one of the jets needed the nose tires changed before leaving. The senior chief said, "Make sure all four spacers are installed properly," and I said, "Yeah senior, I know...I got it."

The jets had to fly a long distance and make numerous stops. After looking at the tires, I



# ice and a Red Leg

agreed with the senior chief's decision about a tire change. I knew a quick change now was better than a jet with a blown nose tire hundreds of miles away.

I looked at my watch and saw we had 1.5 hours to get the tires changed. I gathered tools, new tires, and an AM troubleshooter, and we headed toward the jet to do the job. Having done this simple task many times before, we didn't bother to bring the maintenance pubs. That decision was my first mistake.

We didn't have much time, so I decided to change one tire while the AM3 did the other one—my second mistake. I was the CDI for this job, and I know you never inspect your own work.

We jacked the jet's nose and deflated the tires to remove them safely. I took off the bolts, safety wire, key washer, nuts, and pulled off the tire. With the port tire removed, I inspected the spacers. These critical items allow the wheel to spin freely without damaging the axle or the wheel.

After I inspected the removal, I readied the new tire to be installed, checking the bearings for integrity and ensuring they were the right ones for the FA-18C aircraft. Satisfied with that step, I installed the new tire, placing the inner spacer onto the axle. I then installed the tire, outer spacer, key washer, nuts, bolts, and safety wire.

Just as I finished my side, I could see the pilots walking early toward their jets. They weren't headed for this one, but I was the LPO and felt I needed to cover the launch. I faced a dilemma: I was changing a tire here, and the other aircraft were getting ready to launch and might need my help should they have technical problems. I decided to man the launch and left my shipmate to finish the starboard tire—without supervision. This was my third mistake.


After the first event launched, I went back to check on my AM3. He had trouble attaching safety wire to the tire, so I helped him. About this time, the pilot for this jet arrived. Confident

with the petty officer's work, I gave the wheel a cursory look and signed off the job, releasing the plane for the cross-country flight. Feeling a sense of urgency, I didn't inspect the tire thoroughly—my fourth mistake and a critical one.

On Monday morning, I was told the bearings in that last tire had dislodged when the jet landed in Utah on Sunday. Our squadron would have to send a maintenance rescue team to Utah. After a thorough investigation, the team found the outer spacer had not been installed during the tire change, and the nose-gear axle was damaged beyond repair.

Our squadron now had a jet down for several months. Luckily, no pieces of the broken bearing were sucked into the intakes. The pilot wasn't hurt, and the aircraft wasn't lost.

The lessons in this story are simple. I couldn't blame the young maintainer for this error. It was my responsibility as a CDI to make sure the job was done right. I also never should have CDI'd my own work. If we had taken the pub out to the job and followed it step by step, the outer spacer would not have been overlooked. I was the shop supervisor and should have prioritized my workload. Had I done that, I could have made sure all tasks were covered.

That jet now sits like a permanent fixture. It has a dummy strut (called a "red leg," and I live with the knowledge that my mistakes put it there. 

Petty Officer Burden is the troubleshooter LPO at VFA-94.

**Confident with the petty officer's work, I gave the wheel a cursory look and signed off the job, releasing the plane for the cross-country flight.**

# Whidbey Island Gets High-Tech Paint System

By Tony Popp

**P**owder coating is on the cutting edge of corrosion control for the aviation community, and AIMD's support-equipment (SE) division just received the latest in technology. A new powder-coat facility has been finished, and the SE division is taking the lead.

This facility is the only one for support equipment in the Navy. North Island has a powder-coat facility but does not have the paint-removal capability offered by our burn-off oven and blast booth.

A ribbon-cutting ceremony officially opened the state-of-the-art facility and marked the end of almost two years of work devoted to completing the facility at Naval Air Station Whidbey Island (NASWI).

This unit houses a paint blast-off booth, a powder-coat spray booth, and separate paint bake-off and bake-on ovens. Funding came from ComNavAirPac's pollution prevention (P2) program.


The Seabees in Construction Battalion Unit 417 began building the facility in early 2000. They were tasked with erecting the 43-foot-by-88-foot-by-25-foot pre-engineered building from the ground up. Their effort saved the base \$490,000 in labor costs and considerably speeded up the construction process.

Over the next 18 months, the building's interior was completed, an industrial blast booth and paint burn-off oven for paint removal was set up, and a powder-coat spray booth and bake-on oven were installed. This last item is large enough to hold an entire A/S32A-44 tow tractor.

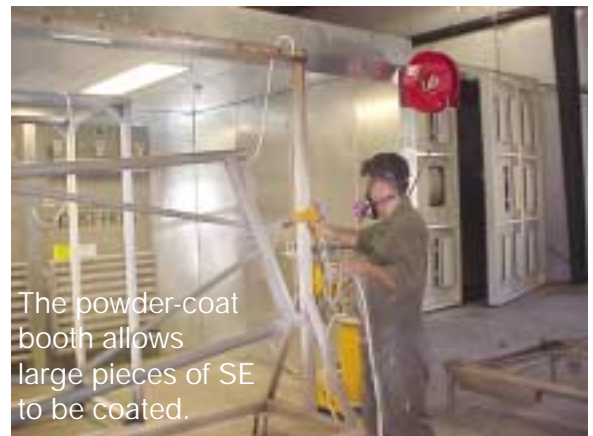
With completion of the powder-coat facility, AIMD Sailors can add the powder-coating process to their corrosion-control methods.

This process greatly will help to protect the environment by reducing the paint and hazmat required for corrosion prevention.

The facility's design has dramatically improved AIMD's corrosion-control capabilities and vastly reduced manpower used in SE's corrosion-prevention program. The new steel-grit blast booth will improve capabilities for corrosion removal and will increase productivity. The powder-coat process will cut the need for periodic corrosion treatment on individual items of SE.

This facility also will have a direct impact on the SE found on the two Puget Sound carriers: USS *Abraham Lincoln* and USS *Carl Vinson*. SE mechanics from the carriers can use the powder-coat facilities at NASWI for their post-deployment corrosion and painting requirements. 

Tony Popp works in the public affairs office at NAS Whidbey Island, Wash.



The powder-coat booth allows large pieces of SE to be coated.



This special gun meters out the right amount of material, reducing hazmat requirements.





# Tailhook Trounces Toes

*By AM3 Brian Moore*

**I**t was a typical mid-cruise day in the North Arabian Sea. The weather was hot and humid, with only the occasional hurricane of jet blast and a steady 30-knot wind over the deck to “cool” things off. We needed to change the up-lock mechanism on the tailhook of aircraft 207, and we then had to do an op-check on the hook to make sure it was safe for flight. This job may sound simple, but it turned into a nightmare.


The tailhook dashpot puts positive pressure on the hook to keep it from skipping over the wires on touch-down and had been drained for the up-lock change. The dashpot normally is not reserviced immediately, and the hook is dropped manually before we apply hydraulic power to the jet. This step keeps the hook from slamming to the deck and possibly chipping a good hook point; however, this time, we decided to service the dashpot before we dropped the hook.

After servicing the dashpot, I went under the aircraft with another AM3 to drop the hook. I’m still not sure why, but I thought I could hold the hook on the way down to keep it from slamming the deck. After solidly putting my shoulder beneath the hook, I told my squadronmate to disengage the up-lock. The hook came down, and, as it moved, I lost my grip and watched as 800 pounds of dashpot pressure slammed down the Tomcat’s tailhook point. Much to my surprise, it didn’t crash to the flight deck. It hit with a thud. And it didn’t take long for me to realize it was because my foot was in the way!

I could feel the pain as the steel toe of my boot crushed into my toenails. As quickly as possible, we raised the tailhook by hand, and I pulled out my foot.

I never thought I would be the man down that often is called over the ship’s 1MC, but I was. I tried walking toward the other side of the aircraft, but other flight-deck people came over to help. They took me to flight-deck medical, where a Corpsman decided to cut off my boot. As they pulled the crushed leather aside, I was ready for the worst. I was surprised and relieved to see all my toes still were attached. The steel toe of my work boots had prevented a 70-pound tailhook under pressure from coming down all the way and completely crushing my foot. I got off lucky; I had only a broken toe, a torn toenail, and several bruises.

What did I learn from this experience? I should have followed procedures. The safety chain would not have been broken had I done the steps in the right order. Always be cautious around moving aircraft parts, even if you’re the person working on those items. A momentary lapse in judgment quickly can lead to trouble. Finally, always wear your personal protective equipment. At the very least, it’ll save your toes.

 Petty Officer Moore works in airframes shop at VF-11.



This foot wasn’t a match for a 70-pound tailhook under 800 pounds of pressure.



Editorial:

# Expect the Unexpected



A greyhound drifted left and stopped in the port catwalk.

*By Dan Steber*

The aircraft dropped down to the engine.



The flight-deck crew tied down the C-2 with as many chains as they could fit.



They removed the passengers and brought out "Tilley."



The aircraft was lifted out of the catwalk and secured.

That cliché, like another often overused but important one—"Keep your head on a swivel"—gained new meaning this week. I had the unfortunate duty to review photos from a mishap that happened almost two years ago. That incident involved an experienced chief who died when a turning rotor blade struck him. My task turned out to be one of the hardest jobs I ever have faced.

The photos that accompany this story are the only ones I can show because they are the least graphic. I debated using these shots at all, but the lessons found in the photos, from clichés, and from this incident are too important not to share. People often think our young Sailors—the carefree, fearless and sometimes careless ones—are the only people who need our attention. This mishap showed danger and death have no regard for age, rank or rate, or experience.

The aircraft maintenance and material division at the Naval Safety Center has a road show known as a maintenance-malpractice presentation. The chiefs and senior chiefs who do this brief (I'm an alumni) use photos that show a survivor from a propeller incident. That blueshirt was lucky; a prop hit him but was

Props, rotor blades, engine intakes, and exhaust can kill.





spinning at less than 20-percent rpm. His cranial shattered, causing a nasty set of cuts, but the youngster survived. The chief wasn't so lucky; he was decapitated and died. As a senior guy, he had considerable experience, but that level of proficiency didn't keep him out of harm's way.

I use the word "luck" often in this story for a reason. People throw around that word as if it were a merit badge, a sign of survival, or a mark of success. "I got away with that one," becomes a notch in a career, rather than serving as a warning. I believe a better approach is found in the modified adage, "I'd rather be good than lucky." That blueshirt didn't expect a prop to hit him that day, and he probably would say his action was stupid, rather than lucky. The chief didn't get a chance to say anything. If you depend on luck and not on skill, savvy or reason, based on an understanding of risk management, you, too, might make a fatal mistake.

Being prepared for any event and maintaining situational awareness is critical, and the crew on USS *Nimitz* used those skills to turn a harrowing experience into a positive one. After a C-2 drifted into the port catwalk, the flight-deck team had to respond. They secured the aircraft, removed the passengers, and got the aircraft back on deck, minimizing further damage. No one on deck that day expected to face such an unnerving challenge, but they responded.

Did we get lucky? Yes, to some degree. The aircraft didn't go into the drink or catch fire, but the flight-deck team's response was skillful and efficient. That group, like most other carrier crews, had practiced crash and fire drills. The team made sure lift points were greased, often used "Tilley" to simulate or to lift aircraft, and

was ready when needed. They maintained situational awareness and reacted with quick, cold precision.

The Greyhound's passengers mostly were VIPs from another country—what an introduction to carrier aviation. The mishap was bad but could have been worse. These visitors were grateful for a team that faced the unexpected with skill, rather than luck.

These stories are a simple reminder that our business is risky, but we can manage that risk and can avoid errors when we respond with well-honed skill.

I didn't know the chief killed by that rotor blade, the men assigned to that squadron and ship, or the officers who live with that awful memory. I can hope only that other Sailors will read this story, will see these photos, and will not make mistakes that lead to injury or death.

Dan Steber is the editor of *Mech*.



This blueshirt's head looks bad, but he survived because of his cranial.

His cranial was shattered; his head was scarred; but he is alive.



The tattered remains of a cranial show the damage caused by a rotor blade.



A shipmate's death is horrible, but we must learn from it.



# Double



## Absent-Minded: Thinking Only of Liberty

*By AM3 Archil Norzea*

**T**he time was 1900 on a Friday. It was a nice October night and was the last workday of the week at NAS Oceana, Va. The line division had had a heavy flight schedule all week long, and we had been at work since 0600 that morning. The whole shop was tired, and my mind was elsewhere.

I was thinking about Halloween parties, and how great my girlfriend would look in her costume. Outside, the jets were put to bed, and the flight line was secured. Toward the end of my shift, the final job of the evening was to move one last Hornet into the hangar. My supervisor told another PC and me to open the hangar doors.


We had to move two doors in the same direction because of the way the hangar doors were stacked. My partner moved the first door, and I began to move the second one. Taking a look at the hangar, I knew we would have the right clearance when the doors were even with the storage cage. It would leave just enough room to get the aircraft inside the hangar.

Looking to see if doors had moved far enough, I stuck my head between them, which I quickly realized was a terrible

mistake. Just then, my shipmate stopped door number one, but I still had my hand on the open button. I couldn't stop the door in time, and my head became lodged between the two. As I hit the deck, I screamed for help and passed out.

Several shipmates came to my aid, got my head loose, and called for an ambulance. I was rushed to a civilian hospital, where doctors found I had a fractured jaw, broken bones in my face, and crushed sinuses. I later was transferred to a military hospital for four days and had reconstructive surgery to my face and head. The military doctors said my cranial had saved my life.

It took three months to recover from my injuries, and I still suffer from numbness to my face. If only I had taken the time to think through the hazards of this simple operation. A third person, whom I did not use, would have been the safety observer. I also should have moved one door at a time.

Shortcuts and a lapse in judgment almost cost me my life. I am fortunate to be alive today, and I owe that blessing to my cranial. I now focus on liberty after I'm through with work and have learned to keep safety on my mind, even when doing simple jobs. 

Petty Officer Norzea is assigned to the line division at VFA-83.

...I had a fractured jaw, broken bones  
in my face, and crushed sinuses.







# Whammy:

By AM2 Harold Hughart

## Poor Judgment and Illegal Shortcuts Equal Disaster



Photographs by Matthew J. Thomas

task required four qualified airframers.

Closing door 64L was critical. That simple step would allow the flaps to travel freely through their full range of motion. Left unsecured, however, sufficient clearance would exist only when the flaps are full up or full down. Any attempt to move the flaps between those two extremes would cause a collision with panel 64L. My shop had other work, which left only three airframers available. I chose to do the job anyway.

When the AMEs were finished, two unqualified airframers—an AM3 and an AMAA—joined me. I did my CDI walk-around and found the AMEs had not closed door 64L. I didn't have the fasteners to close it, so I told my AMAA to push down on the panel, until the trailing edge flaps were in the full-down position. I then told my AM3 to man the cockpit and to run down the flaps when signaled.

Though unqualified for the task, the AM3 seemed ready to prove his worth, so I gave him a brief lesson and proceeded with the job. My errors were piling up, and it didn't take long

Our squadron was on detachment in Fallon, Nev., and the tempo had become routine. We had done lots of jobs on our Hornets, and new technicians had done much of that work. I began my shift as the supervisor and was lucky to have that title at shift change.

We had a 400-hour aircraft inspection on the schedule. That task required us to remove the trailing-edge flap shrouds. With the flaps in the up position, we would need electrical and hydraulic power to run them down. This presented two problems: The AMEs had to finish working inside the 64L access panel, and this




before this last mistake turned into disaster. Had I used ORM, it would have stopped me a long time ago, but I didn't have the foresight to use it.

With hydraulic power already on the aircraft, I applied electrical power and signaled the AM3 to lower the flaps. The flaps came to the full-down position, and I gave a "thumbs up" to verify this. Meanwhile, with the flaps now down and clear, the AMAA let go of door 64L. The AM3 in the cockpit misinterpreted my "thumbs up" signal and secured electrical power without my consent.

With hydraulic power still on and no electricity, the flight controls reverted to the back-up mechanical mode and attempted to drive up the flaps. As they did so, the left flap crunched panel 64L. I heard the AMAA scream on the left-hand side of the aircraft, I immediately ran to the hydraulic test stand and shut off the unit. Not knowing what had happened, I thought he was injured. I was thankful when I got to the other side and saw he was just a bit dazed and confused. The flap, however, was not so lucky. We damaged it and would have to replace it, but supply didn't have one.

I screwed up...big time! I should have told maintenance that I had to wait on my qualified cockpit operator to finish another task. I should have taken the time to get the fasteners for the panel and should have

secured it. I shouldn't have thrust well-intentioned but untrained maintainers into a rushed job. I sure as heck didn't set the right example for these youngsters to follow.

I'm thankful no one was injured, and I luckily kept my job. As a result of this unfortunate mishap, I have become a much better supervisor. I now take time to instruct everyone thoroughly on each task and make them review every precaution. Ground-crew coordination training and operational risk management are tools that can prevent this type of mishap. I work diligently to include their steps in every job we do. One of those steps is to be assertive, and I now am not afraid to consult with the maintenance-control chief on priorities and manpower issues. 

Petty Officer Hughart wrote this story while assigned to VFA-83. He now is assigned to AIMD Norfolk.

*This story reminds me of a CO's response I read after his maintainers illegally had rigged an ejection seat. The seat somehow interfered with the control stick, and we lost a Hornet. The CO said, "These maintainers did not have malice in their hearts." I'm sure that's true, but anytime a maintainer takes a shortcut, an aircraft and aircrew run the risk of not coming home. Doing it by the book is the only sure way to avoid maintenance error.—Ed.*

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Do yourself a favor; read the story on sun exposure in the January 2003 issue of *Approach*. In the next issue of *Mech*, read about the NavAir response center and how it can help you.





# I Thought It Was Good to Go

*By AO1(AW) Michael Dixon, Jr.*

Our squadron had completed a successful Western Pacific deployment and now was enjoying a proud sense of accomplishment. We felt untouchable and immune to anything and everything. It took only a tow tractor to ruin that high.

The workday had begun like any other one: a fine Navy day. We reported for work at 0630, and the morning maintenance meeting began at 0700. Line-division personnel already had begun pre-operational inspections of the support equipment.

Those inspections turned out good, except for one on an A/S32A-42 tow tractor. An airman inspector noticed the starboard aft wheel was missing all but one of its lug nuts. That airman immediately notified his supervisor, who, in turn, told everyone in the division not to use the tow tractor. The supervisor then called AIMD GSE and passed on the information about the tractor. Ten minutes after that word was sent, maintenance control told the line to tow aircraft 402 to the wash rack.

The supervisor gathered his available people, checked out a tow tractor from a sister squadron, and proceeded to tow 402 to the wash rack.

Thirty minutes had passed, and a mech from power plants needed to leave for AIMD GSE to check out an engine stand. That AD3 walked toward the line shack to check out the tow tractor, but he noticed the line supervisor was at the far end of the flight line. The mech decided to save time by driving the bad tug to the supervisor.

He rationalized that the drive would be quick; the request would be short; and the pick up at AIMD would be easy. He did a quick walk-around of the tow tractor, jumped on, and drove onto the ramp. As the AD3 neared the end of the flight line, he made a sharp left turn, shearing the one bolt holding on the wheel. The starboard wheel rolled off, and another one jammed under the tractor, immediately stopping it. No one was hurt, but the mech was humiliated when he had to explain what had happened to the maintenance chief. Trying to explain why he

had failed to do a proper preoperational inspection, the AD3 stated, "I thought it was good to go."

The mech didn't do even a quick pre-op, but the line also should have tagged or marked the down status on the tractor. They also should have notified maintenance control.

ORM teaches us to

assess and minimize risk by identifying hazards and implementing controls. This low-risk job turned into a major problem because of a failure to communicate.

Petty Officer Dixon is the safety petty officer at VFA-195.





***Keep learning,  
and teach others what you***





**ou know.**

Poster idea contributed by  
ADCS Carlos Rivera and VAQ-134  
Photo by John W. Williams  
[www.safetycenter.navy.mil](http://www.safetycenter.navy.mil)



By AN Erick Duran

Our squadron was on board USS *John C. Stennis* (CVN 74) for pre-deployment work-ups. After the routine man-up of an E-2C, the blueshirts removed the tie-down chains, and I carried them with me. I was beside the Hawkeye and walking toward cat 1. I wasn't flight-deck qualified, so I stayed between two qualified people and was being as cautious as possible. Things were about to change, though.

As we headed toward cat 1 for the launch, the jet blast deflector (JBD) started to go up for a Greyhound, which was preparing to launch. Not wanting to get stuck behind the JBD, we hurried around to the starboard side and began to move forward. We still were aft of the JBD on elevator 1 and about four feet from the side of the ship when the C-2 went to high power. The Sailors in my squadron know the dangers of the props, but the unexpected strength of the prop-wash from a turbo-prop at high power was remarkable. The amount of air rushing around the JBD and outboard onto elevator 1 caught us by surprise.

The chains that had been across my shoulders got whipped across my neck. Before dropping to the deck to grab a pad-eye, as I had been taught to do, I turned my body to the left and away from the side of the ship. I thought that move would let me grab the chains to keep them from choking me and would keep them from going over the side. That's when the blast fully hit, though, sending me backward, over the side of the ship, and into a safety net outboard of elevator 1.

If that net hadn't been there, I would have had a quick 70-foot drop to the water. Two shipmates tried to stop me, but everything happened too fast. After the C-2 launched, they ran over and pulled me out of the net. I was scared; the incident gave new meaning to the term brownshirt, but I wasn't hurt.

That episode made me realize just how quickly the flight deck can become a dangerous place. Prop-wash like jet blast must be respected anytime a plane goes to high power. Everyone also needs to remember that danger exists behind the JBDs and also outboard of them. I'm living proof that a mishap can happen when you least expect it.

Airman Duran is a plane captain at VAW-112.

*I did a story in the fall 2001 issue about a Sailor blown overboard. It was a freakish incident but, nonetheless, gave a maintainer an unwanted swim. A Sailor in November 2002 spent 7.5 hours in the water after*

# Blown Into the Net



*being blown overboard. He sadly watched as his workplace and temporary home floated away. He had lost his cranial, and his light didn't work. Two critical visual clues were gone, and search crews couldn't see him at night; you can read the full story in an upcoming issue of Fathom. This hazard is not new or unheard of, but the statistics are interesting. From 1997 to mid-2001, Naval Safety Center records show one person blown over the side or into the nets. Since mid-2001 (most after 9-11), I know of at least four other cases, and the real number actually could be higher because our hazrep database is backlogged and some incidents go unreported. I can't say with statistical purity that the surge in this type of incident is due to the perceived urgency of current events, but the numbers are noticeable. The story I just shared—and the future Fathom story—is an attempt to grab every reader's attention. It doesn't take much to become distracted, to take a step in the wrong direction, or to have an aircraft unexpectedly turn on you. Our country needs you safe and dry, and you don't need ORM to tell you never to take unnecessary risks, to rush a job, or to do maintenance by shortcut. Any of these bad practices could lead to a damaged aircraft or a dead Sailor or aviator.—Ed.*





A hit to the face...



from a worn winch assembly...



will make your face swell.

# Whacked by a Buddy Store

*By AM3 Gregory Riebli*

Jets steadily were hitting the deck, and the flight schedule was coming to a close on board USS *Carl Vinson* (CVN 70). I was working in the airframes shop of an S-3B squadron that had broken records for fuel passed during the first few months in support of Operation Enduring Freedom. We were three weeks from the end of a six-month cruise when I was injured on the flight deck.


One of our aircraft had landed with a bad aerial-refueling store (ARS). I was motivated that night and decided to help the ARS shop remove that buddy store and did so with little difficulty. We rolled out a good ARS on a dolly and began to raise it to the pylon. The dolly has metal handles that attach to a winch and hoist assembly. That arrangement allows you to crank the store into place.

The aft part of the store is the heaviest, so a great deal of weight sits on the back end of the dolly and on the aft hoist assembly. This design creates tremendous tension on the winch assembly that cranks up the store. That device was on my end of the dolly, and it was worn and tattered from one heavy load after another. I wasn't aware of any damage at the time and wasn't concerned with anything, except loading the store and getting the jet ready for the next scheduled event.

We started to lift the store, and everything seemed OK. When the ARS was about halfway up, the handle got stiff from the tension, slipped off, broke free of the

Velcro that helps to secure it, and whacked the side of my face. I'm not a little guy (6 foot 4 inches tall and weigh 275 pounds), but the impact nearly knocked me out. My entire head hurt intensely, and I couldn't move my mouth. I tried to convince myself I was fine, but the pain just increased. I decided to go to medical, and, within an hour, I was in surgery to reset a broken cheekbone on the right side of my face. The doc was good, and he was able to do oral surgery, avoiding extensive scarring. I received stitches along my entire gum line and spent three days SIQ. I also was on limited duty for the rest of our deployment.

My accident was significant for two reasons: I was injured, and the handle had fallen off before. A shipmate had received stitches on his eyebrow because of the same problem. The handle's bad design needs to be changed before another Sailor gets hurt. This problem should have been documented earlier.

I cannot place total blame on engineering, though. The crank was worn, and I was more worried about completing the task than my own safety. I should have slowed down and should have given the equipment a thorough check. Had I done those two simple steps, I wouldn't have made a trip to medical. Instead, I ended up with a broken face and had a bad end to an otherwise great cruise. 

Petty Officer Riebli wrote this story while assigned to the airframes shop at VS-29.

# BRAVO ZULU

AE1 Randall Ackley

## HM-14

While deployed to Bahrain with HM-14 Det 1, Petty Officer Ackley made an incredible discovery. After many days of trouble shooting and changing components on an MH-53E rotor-brake system, he diligently started to open one panel after another, looking at individual aircraft wire bundles. His effort paid off when he found degraded Kapton wiring in a harness that holds several wires for the rotor-brake and blade-fold systems.

Petty Officer Ackley's find resolved the problems with the aircraft and also revealed a deeper discrepancy. After researching maintenance diagrams and schematics, he discovered a rotor brake could engage at high-rotor rpm when certain wires within the same bundle touched. His efforts led the command to release a hazard report to alert the fleet about this potential—one of many dangers related to Kapton wiring.



AM1 Richard Weatherly

## HC-8

While doing a pre-cruise aircraft material condition inspection on Bayraider 63, Petty Officer Weatherly discovered a problem. A rigid line between the utility hydraulic reservoir and the utility hydraulic pump had chafed against the airframe in the aft pylon area.

Given the severity of his find, the squadron submitted a hazrep and did a one-time inspection of all squadron aircraft. That search led to similar discrepancies on Bayraider 25.

In an unrelated incident, Petty Officer Weatherly inspected the forward rotor head on Bayraider 00 and found the horizontal hinge pin on the forward yellow blade had shifted within the rotor-hub assembly, damaging the hub.



AT3 Timothy Anderson

## HSL-51 Det 11

While washing an aircraft at NAF Atsugi, Petty Officer Anderson discovered excessive play in a tail-rotor, drive-shaft viscous damper on Warlord 11—the Seventh Fleet's UH-3H. He immediately notified a QAR, who determined the viscous damper was out of limits—40 thousandths of an inch, to be exact. Petty Officer Anderson was not required to check this part during the wash job; however, he did while the drive-shaft cowl for the tail rotor was open.

One week later and immediately before a night launch, Petty Officer Anderson noticed a hydraulic leak on a dark deck. He told the pilots of the problem and summoned a QAR, who determined that the auxiliary, hydraulic, servo pump had failed. At the rate the pump was leaking, an in-flight emergency would have occurred within five minutes of takeoff. His keen attention to detail prevented a serious problem.





AE3 Gary Thompson and AE3 Brian Fansler

## VS-30

During Operation Southern Watch, Diamond 700 was downed for direct-lift control. The DLC problem stumped the AEs until they thoroughly researched the gripe and did a step-by-step maintenance review of the entire system. They found the book was the problem.

Petty Officers Thompson and Fansler discovered an error in the wiring diagram for the AOA system. Their quick but thorough troubleshooting prevented the indefinite loss of an aircraft in a critical phase of operations.

AN Lawrence Niedermayer

## VFA-195

The Air Force invited Airman Niedermayer to help brake check an F-15. During this check, he noticed smoke and hydraulic fluid coming from one of the engine-bay panels. He also found a fuel leak from the aft portion of the engine.

The airman notified a tech sergeant, who then opened a panel to check the hydraulic leak. The AMAD had caught fire, and the flames were starting to spread. Airman Niedermayer quickly signaled the "lazy eight" fire signal to the pilot, then ran for a nearby Halon bottle, passing it to the crew chief.

Upon returning with the second bottle, Airman Niedermayer saw the pilot still was in the jet. He quickly got the pilot's attention and frantically signaled for him to get out of the aircraft.

*For more information, read the story, "Navy Man Helps Save an Eagle" in this issue.—Ed.*



Sgt. Anthony Angell and LCpl. Wesley Trawick

## HMLA-369

These Marines removed an access panel to the turret-control amplifier and discovered a severely gouged and damaged forward, lateral, cyclic-control tube. In an effort to determine the nature of the problem, they partly reinstalled the panel and found a cannon plug had caused the damage. They then notified Quality Assurance.

A QAR and airframes rep determined a flaw existed in procedures for installing the forward, starboard, AAR-47 sensor. That part was installed as part of revision A to airframes change 230. The faulty step allowed the cannon plug to touch the gunner's cyclic-control tube, which caused a severe chafe and deep gouge. The command submitted an EI and HMR, detailing Sgt. Angell and LCpl. Trawick's find. Their effort prompted a fleetwide change to the installation procedures.



continued on pg. 26



# A Gotta-Get Attitude Turn \$135,248



It was a Monday morning, turnover day for people returning and departing on post-deployment leave. My chief assigned me a simple job: Return our deployment pool of electronic-counter-measure assets to NAS Oceana before the end of the week. That load contained six ALQ-167 pods, a conversion kit, and five ALQ-126B modules. The equipment was in good shape but wouldn't stay that way.

Tuesday arrived, and we had everything staged and ready to go. The modules, pods and conversion kit were banded onto pallets. It now was time to get a suitable vehicle to transport the assets. We tried all day to check out a truck, but no dice. At the end of the day, we decided to store the equipment in a secure area and to try again on Wednesday morning—after quarters.

On Wednesday morning, the chief said supply had leased a Ryder flatbed truck, and we could use it later in the day. Wanting to make sure everything was set, I asked the chief, "Who's going to drive?" His look gave me the answer. I had driven moving vans across country several times, didn't mind driving big trucks, and earlier had told him about my experience. I asked him if a special license was required, and he answered, "No." The truck had been leased by the ship and was not a government vehicle.

Everything seemed in order. We now only had to wait for the truck. At about 0915, the chief called and told me the truck was ready. An AT2 and I went to the hangar, removed the equipment from secure storage, and readied the gear for movement. We then grabbed a couple pallet jacks and began to move the gear onto the elevator, where a crane would lower the equipment to the pier. I called the supply chief about the truck, but he told me it had been diverted on another supply run and wouldn't be back for an hour.

The truck finally arrived at 1115. I went down to



# -It-Done ns into a Mishap

the pier to supervise the gear offload, while the AT2 remained on the elevator. The crane operator lowered the pallets from the ship onto the pier, and a forklift driver loaded them onto the truck. We had to put five pallets on a 15-ton flatbed, so that meant we would have to squeeze out every inch of space.

I told the forklift operator to put the first two pallets of ALQ-167 pods on the truck and to push them as far forward as possible. He also had to position them parallel with the bed of the truck. The third pallet was a conversion kit, which was housed in a fiberglass container. The forklift operator put it behind the first two pallets, centered on the bed of the truck. The fourth pallet also contained ALQ-167 pods. I clearly could see that load would not fit parallel with the bed of the truck and still leave room for the remaining pallet of modules. I told him to put the load perpendicular with the truck bed, directly behind the conversion kit.

I could see the truck was too small to move all the assets in one load; however, the day was getting late, and I was determined to finish the job in one trip. The pallet of modules wouldn't fit on the bed, so I had the forklift operator put the modules on top of the conversion kit. I didn't like this solution but figured, "Hey, we're driving on the interstate for most of the trip; we won't make any high-speed turns; and everything should be fine." After all, each pallet weighed at least 1,000 pounds. How could they move? It never crossed my mind to secure the pallets to the truck.

At noon, we departed the pier and proceeded east on the interstate toward NAS Oceana. After just a few miles, we hit a bump in the road, and I heard a loud "Whummmp" from behind. I looked in my rearview mirror and saw the rear pallet had shifted considerably to the right. I told the AT2 that I was going to pull over, see what was wrong, and straighten the load. I

carefully maneuvered to the right-hand lane and then proceeded onto the shoulder.


In an attempt to slow down, I first applied light pressure to the brake pedal. That technique didn't work, so I mashed down harder to see if that would help. Sure enough, it did! The truck slowed down but much more quickly than expected. In fact, the truck stopped much faster than the pallet of modules resting on top of the conversion kit. The modules flew off the flatbed and landed alongside the interstate, striking two pods on the way down. When the pallet hit the ground, the bands broke, sending modules and pieces of them everywhere.

After safely stopping the truck in the curb lane of the interstate, we got out to survey the damage. I never had seen such a mess, and it was all my fault. The equipment was smashed into unidentifiable shapes, and sand and grass covered the items. The pods were in a little better shape, but a couple had nasty dents. Looking at the damage, I couldn't help but notice the cargo straps permanently affixed under the flatbed. I easily could have prevented this mishap had I used this simple device.

After a long struggle reloading the 200-pound modules, we now used the flatbed straps to secure the load before proceeding. Our effort was too late. Figuring my career probably was over, I wanted to finish this job and to head back to face the music.

This sad story gets worse. After we left the interstate, I moved into the far right-hand lane. In a few seconds, the AT2 and I noticed the telephone poles were close to the road's edge. We were concerned because two pods behind the conversion kit extended beyond the bed of the truck and might hit the poles. I then decided it would be best to move into the far left lane; however, traffic prevented a quick lane change. You can guess what happened next, "Cruuuunch!" One of the pods struck a telephone pole, knocking off the nose cone. A bad day just had turned worse!

I felt sick and wanted to hide. I pulled over to inspect the damage. We then proceeded—in dumb-founded silence—to NAS Oceana without further incident.

A two-minute review of the basic principles of ORM easily would have prevented this mishap. I didn't identify how out of control this simple job had grown. In the end, we had wasted \$135,248 because of our haste to "get the job done." 

*The author is an anonymous Sailor, who works in AIMD aboard USS Enterprise.*





## Old Systems, New Technology.

# Three Ways NavAir Is Helping the Fleet

## Team Effort Saves Government Money

*By Renee Hatcher*

NavAir's Support and Commercial Derivative Aircraft Program (PMA-207) accepted a completely refurbished fuel tank to be used for aerial refueling in the Marine Corp's newest tanker, the KC-130J.

PMA-207 is leading efforts to save the government millions of dollars by salvaging fuel tanks from retired C-130 tankers, refurbishing them, and converting them to the new J-model configuration. The old tanks are taken apart, put back together again with new pumps and electrical assemblies, and finished with a fresh coat of paint.

"We are taking these old tanks, making them like new, and extending their service lives," said Tom Bly, of PMA-207.

NavAir can refurbish one tank for about \$50,000. The cost of purchasing a brand new tank would be about \$1 million. Their goal is to refurbish 50 tanks.

The C-130 Fleet Support Team at NavAir Cherry Point provides the engineering and logistics support for this effort. The FST developed the engineering specification that provides the refurbishment and conversion instructions. The NavAir Support Equipment Rework Facility at Solomons is doing the work.

"This is part of our commitment to the warfighter. We plan to use the extraordinary facilities and resources of NavAir and to provide superior naval-aviation technologies," Bly said.

The first tank was scheduled for installation in the next KC-130J ready for delivery. Refurbished tanks will be sent to the Lockheed Martin production facility in Marietta, Ga. and will be installed in J-models. Locked into the rear of the aircraft, the tanks carry 3,600 gallons of jet fuel for offloading to receiver aircraft. The Navy and Marine Corps have contracts for 13 KC-130Js. Nine have been delivered and are now in the developmental test phase.

## NavAir to Accept First CH-46 Engine Upgrade

*By Renee Hatcher*

NavAir received the first T58 Engine Reliability Improvement Program (ERIP) gas-path module during a ceremony at the General Electric Aircraft Engines (GEAE) facility in Lynn, Mass.

Working with GEAE—manufacturer of the CH-46E helicopter's T58-GE-16 engine—NavAir and the Marine Corps launched a \$200 million effort 18 months ago to reverse a severe decline in engine reliability. That effort also was designed to provide safe performance to bridge the gap during an extended transition to the replacement MV-22. Managed by NavAir's H-46 Program Office (PMA-226), ERIP is running ahead of schedule and under budget.

The GEAE gas-path module will be assembled into a complete engine with overhauled accessories at Naval Aviation Depot Cherry Point, N.C. This modification will upgrade the engine to the T58-GE-16A and will significantly increase reliability and performance



with new hardware and modern engine manufacturing and assembly processes.

Completion of the assessment will trigger a Milestone III full-rate production decision, which occurred March 12, 2003. Production deliveries of T58-GE-16A to the fleet will begin between April and May 2003 and quickly will ramp up to eight per month. The program plans to upgrade 449 engines.

## Publications Available on Web

*By Vicky Falcón*

Responsible for more than 5,000 manuals and technical directives, AZ2 Tammi Nolan and her co-workers at Naval Air Station Corpus Christi, Texas, are busy people. They appreciate the push NavAir has made to get its more than 20,000 publications posted electronically.

Nolan, who has worked with publications at HM-15 for two years, welcomes the change. "It makes my job a lot easier," she said, describing her daily tasks of filling requests for publications and updating manuals. "We used to get large, bulk amounts of changes by mail, but now we can download them on line," she said, adding, "The website relieves a lot of paperwork and the hassle of incorporating changes manually."

The site she is referring to is the Naval Air Technical Data and Engineering Services Command (NATEC) website, which can be found at [www.natec.navy.mil](http://www.natec.navy.mil). NATEC is part of NavAir and is the central repository for all NavAir technical publications.

According to Tim Ruth, NATEC web project manager, NavAir has a goal of getting all 20,000 publications on line by 2007. "We have more than 8,100 manuals on our website and are ahead of schedule," he said. "In the past, users had a hard time stocking publications," said Ruth. "A lot of our aircraft have very old publications, dating from the '60s and '70s. Copies got lost, the original was illegible, and, with a constant turnover in the fleet, it was hard to track down who actually owned the publication."

According to Ruth, the NATEC website is addressing those issues. "Ninety-one percent of the stuff on our website is POD G—printable on demand," he said. "Once a manual is POD G, publication managers

### Flight, Flight-Related, and Ground Class A Mishaps 12/13/2002 to 02/06/2003

Aircraft	Command	Date	Fatalities
FA-18A	NAVSTKAIRWARCEN	12/18/2002	0
Pilot ejected during air-wing training flight.			
FA-18A	VFA-97	01/06/2003	0
Aircraft departed runway on landing rollout.			
FA-18C	VFA-25	01/17/2003	0
Aircraft departed runway on landing rollout.			
FA-18D	VMFA(AW)-225	01/17/2003	0
Aircraft lost at sea during a functional check flight.			
AH-1W	HMLA-775	01/22/2003	4
Midair collision between two aircraft during NVG flight.			
F-14D	VF-213	01/26/2003	0
Tomcat crashed into sea during an approach to ship.			

### Class B Mishaps 12/10/2002 to 02/06/2003

F-14B	VF-11	12/10/2002	
During a cross-country flight, the refuel-access panel separated, damaging the starboard engine.			
P-3C	VP-30	12/19/2002	
An unattended maintenance vehicle struck the aircraft's propeller and fuselage.			
HH-60H	HS-6	01/07/2003	
During a refueling, the aircraft's fuel cell was overpressurized, causing airframe damage.			
F-14B	VF-101	01/30/2003	
Aircraft blew a tire on landing and ran off runway.			
E-2C	VAW-11	02/03/2003	
The Hawkeye slid into a parked aircraft, damaging both, and debris from that collision also hit a third aircraft.			

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Naval Safety Center  
Data: Dr. Michael S. Borowsky

For questions or comments, call Dan Steber  
(757) 444-3520 Ext. 7247 (DSN 564)



don't have to keep it in stock anymore—it can be looked at digitally or paper copies immediately can be requisitioned.”

Ruth and his 13-member editing and conversion team use two methods to post publications to the website: They scan the original paper documents, converting them to an electronic format before posting, or they receive the documents in an electronic format directly from the program offices. “We work closely with data managers throughout NavAir,” said Ruth, who explained that more than 3,000 publications are in the update cycle. When those updates are completed, they send them to NATEC for posting.

William Carey is the Central Technical Publications Librarian Program Manager for Sikorsky Support System, Inc. at Naval Air Station Meridian, Miss. He manages over 7,900 publications using the NATEC website on a daily basis. “The NATEC website provides me current information regarding the latest

changes and IRACs to all my manuals,” said Carey. “It informs me when our manuals become digital and are placed on the NATEC website, making it convenient to order manuals or publications from the Naval Logistic Library.”

Carey is one of many users of the NATEC site, which already has set up 25,000 accounts and averages 40,000 to 50,000 log-ins per month. “We’ve filled more than 105,000 POD G requisitions since early 2000,” said Ruth. “We’re here to serve the warfighter,” Ruth continued. “[*They have*] the right to expect the best guidance, counsel, advice, and support regarding any naval-aviation technology, and this is one way to give [*them*] that support.”

Renee Hatcher and Vicky Falcón work in the NavAir public affairs office.

*For more information about the Naval Air Systems Command, supported programs, or to review press releases, visit their website at [www.navair.navy.mil](http://www.navair.navy.mil).—Ed.*

## BRAVO ZULU

AD2 Gabriel Gonzalez

### VAW-113

Petty Officer Gonzalez was helping with a high-power turn on an E-2C that was needed to troubleshoot an engine discrepancy. The safety chain was in place, and the aircraft was ready to begin a high power.

During the turn, a ship's Sailor ignored the safety chain, walked into the propeller wash, and was blown down by the blast. AD2 Gonzalez immediately grabbed the Sailor and kept him from being blown overboard or into the catwalk, which could have caused serious injury.



AO2(AW) Hector Avendano and AM3(AW) Yuri Lyalin

### VAQ-131

During an engine cross-bleed start, Petty Officers Avendano and Lyalin watched as an airman on the catwalk walked beneath the exhaust of their EA-6B. They instantly recognized the danger to anyone around the engines at that power setting. Before they could act, the pilot brought one engine to high power, and the unsuspecting airman climbed up from the catwalk below. To avert a problem, AO2 Avendano grabbed the airman.

The young Sailor continued to walk toward the exhaust, and, before Avendano could grab him a second time, the airman was swept off his feet and fell over the deck edge toward the safety netting. Petty Officers Avendano and Lyalin grabbed the Sailor's leg, but they could not hold him. The Sailor fell overboard, floating for seven hours before a SAR team found him.

*Read the whole story in the April-June issue of Fathom.—Ed.*





By AO1(AW) Michael Dixon, Jr.

During a detachment to Japan, one of our line guys—Airman Niedermayer—was assigned as a hot-brake checker. He and several maintainers were located at the taxiway end of 05L. An F-15 hot-brake team also was present. The first recovery was uneventful, and the Navy and Air Force teams got along well. They even compared procedures. It wouldn't be long before a Sailor would help to save an Air Force asset.

After exchanging notes, a crew chief allowed the Sailor to brake check an F-15. Airman Niedermayer stood next to the crew chief, as the rest of the Air Force team chocked the aircraft. The crew chief then left to pin the aircraft, and the Sailor walked to the port side of the jet to check the brakes with a tech sergeant. As the Air Force counterpart inspected the brakes, Airman Niedermayer noticed a steady stream of smoke coming from the left engine. He also saw a continuous stream of hydraulic fluid coming from one of the engine-bay panels and found fuel leaking from the aft portion of the engine.

He quickly notified the tech sergeant, who then opened a panel to check the hydraulic leak. The AMAD had caught fire, and flames were starting to spread. As the tech sergeant ran for his crew chief, Airman Niedermayer quickly gave the “lazy eight” fire signal to the pilot. He then ran for a nearby Halon bottle and handed it to the crew chief, who began to discharge the contents onto the fire. Airman Niedermayer then ran for a second bottle.

When the airman returned, the pilot still was in the jet and didn't get out until Airman Niedermayer finally

caught his attention and frantically signaled for him to get out. The pilot shut down the engines, unstrapped his harness, opened the canopy, and climbed out of his cockpit. Airman Niedermayer assisted the pilot, guiding him to a spot away from the aircraft. Seven minutes later, the fire crews arrived on the scene.


Afterward, an Air Force source filled in the rest of the story. The Eagle pilot had been waiting for his hot-brake check, when an AMAD warning light in the cockpit lit up. This light indicated the fire had started in the engine bay—the AMAD literally had disintegrated. Airman Niedermayer's identification of the smoke and hydraulic leak and his quick actions

## Navy Man Helps Save An Eagle



Photograph by  
Sgt. Aaron D. Allmon II  
photo modified

prevented a major mishap.

We learned always to be ready for the unexpected and never fall into a routine. Everyone involved in this incident thought it would be just another day at the office, but events quickly changed, and a normal task turned into a few minutes of sheer excitement. 

Petty Officer Dixon is the safety petty officer at VFA-195.



## ***Almost Killed by a Practice Bomb***

*Mech, Spring 2002*

I'm an ordie, and I'm especially interested in Petty Officer Love's story. We have used BDU-33s for years without incident, after replacing that poorly designed and dangerous firing pin with the Australian "Aust Mk2" (NSN 1325-66-089-6889). This device is similar to the type pin used in the BDU-48. It actually is better because the new pin requires the cartridge to override a rubber grommet to fire the Mk4 spotting charge.

Sergeant Rob Powell

Royal New Zealand Air Force

*Thank you for this information. I have passed it on to our weapons safety analysts for review—Ed.*

## ***Humpty Dumpty Had a Great Fall***

*Mech, Fall 2002*

I read this story with interest. I'm the maintenance manager for a P-3 site at Corpus Christi, Texas. OSHA recently has been looking at the aviation community, and they have been hitting us hard, especially in the fall-protection area. OSHA was concerned with the way we install and remove intake covers and various plugs, which mirrored the method described in Chief Roblyer's story.

Using the items in the accompanying photos, we solved our problems. They can be installed from a lower height, can be removed by pulling on a lanyard, and are made from reinforced vinyl and replaceable foam inserts. They're built by Bruce's Custom Covers—the company website is [www.aircraftcovers.com](http://www.aircraftcovers.com) and phone numbers are (408)738-3959 and 1-800-777-6405. The intake plug is part number LP3-100 (\$296.80 for four) and oil cooler plug is LP3-110 (\$207.00 for four).

David Stewart

Maintenance Manager, Raytheon Aerospace LLC  
Corpus Christi Air Branch

Phone: 361-698-6904

E-mail: [dstewart@raellc.com](mailto:dstewart@raellc.com)

*Your letter may help to solve a nagging problem that has hurt Sailors at least four times in the last few years. Fleet maintainers always are looking for items*

*that make their job easier, safer, cleaner or better, and they might contact you about these new products.—Ed.*

## ***Another Wheel Bearing Incident***

I don't want to overdo it, but these photos are from LCdr. Robert "Mighty" Quinn of VFA-83. He said no photos exist of the bearings because they were "dissolved to mush." Every maintainer must do their utmost to prevent this repeat problem. Check the bearing part numbers before you build a wheel assembly.

ATCS (AW/SW) David Clark

Naval Safety Center



The wrong bearing caused this brake damage...



and this axle damage.





# Survey Spotlight

## Stupid Is As Stupid Does

By AMC(AW) Mike Malley

**M**any people recognize Forest Gump's words, and I often repeat them when someone does an unsafe act, skips a procedural step, or doesn't use a manual. Unfortunately, such simple maintenance errors are forming a trend that could damage equipment, lead to injury, or kill.

In my short career, poor maintenance practices and shortcuts used to be the exception, not the rule, but I can see that situation changing. How did we let this happen? I think it leads back to one simple fact: a lack of proper training and supervision. During safety surveys, I often find evidence to support that point, especially in the area of pre-op inspections on support equipment, IMRL gear, and shop equipment.

In the last 16 surveys, I have found 10 commands with a wide range of discrepancies—most had problems with tire-inflator kits and NAN carts. I often find these nine common discrepancies:


- Overpressurization bleed valves have missing petcocks (butterfly valves).
- Tire inflator kits have missing or unreadable calibration stickers.
- Tire valve-stem adaptors are missing the Teflon O-ring or valve core (P/N 1000-22).
- Pressure gauges are damaged from an impact or from being dragged across the flight line or deck.
- Inflator-assembly kits or NAN carts have pre-op inspections that were incomplete, "pencil whipped," or not done.
- Pre-op inspections are not entered on OpNAV 4790/52 Cards.
- Inflator assemblies are not calibrated for the type aircraft or have the wrong pop-off pressure.
- Inflator-assembly cases are not marked with the

type aircraft, wheel assembly, and operating pressures.

- NAN-2 cart bins are full of FOD.

During my last visit, the squadron did not do pre-op inspections, had an unqualified airman sign the "inspected by" block on OpNav 4790/52 cards, and didn't do accurate tool inventories. I also found a tool that was missing pieces, a voided calibration sticker on the pressure gauge, tools that had been used on aircraft before flight and not documented, and technicians who were unfamiliar with equipment and maintenance policies and procedures. These discrepancies would cause severe heartburn in any maintenance department.

When maintainers do pre-ops from memory, I become edgy. When I ask for the pre-op cards and shop personnel have to search for them or make up excuses for why they're not available, I become suspicious.

Supervisors, maintenance CPOs, and program managers never must allow maintainers to ignore basic maintenance procedures. If we become soft or turn a blind eye, we are setting up everyone for failure. 

Chief Malley is a maintenance analyst at the Naval Safety Center.

For more info...

Periodic maintenance requirements for the tire inflator kit, P/N M85352/1 and dual chuck stem gauge, P/N M85352/4, are located in NavAir 17-600-174-6-2, and the pre-operational checklist is NavAir 17-600-174-6-1. These MRCs should be accessible and used by all qualified tire-and-wheel technicians.



An uncalibrated tire inflator assembly is dangerous.

# CROSSFEED

Cdr. Al Stephens  
Head, Aviation Maintenance  
and Material Division  
allen.stephens@navy.mil

AMCS(AW) Steven Novak  
Editorial Coordinator  
steven.novak@navy.mil

## TECH PUBS

### Incorporating IRACs Into Publications

*By SSgt. Van Jones*

Squadron visits have revealed a negative trend in the central technical-publication librarian (CTPL) program. Specifically, I see problems in the way librarians are incorporating interim rapid-action changes (IRACs) into NavAir publications, both on paper and on CD-ROM. Some people see this problem as a small issue, but the function is critical to the safe maintenance and operation of naval aircraft.

It is critical that IRACs are incorporated quickly and efficiently. This vital process ensures maintainers have available the most current maintenance procedures. These IRACs are issued when a serious safety hazard exists and the wait time for a formal change is unacceptable.

The CTPL is the command's formal point of contact on this matter, but I have found many librarians lack experience or have not attended the formal CTPL school. This shortcoming means many people are confused about how to incorporate IRACs, jeopardizing maintenance and flight safety.

NavAir 00-25-100, work package 20, paragraph d, offers help on how to incorporate changes on paper and on CD-ROM. This manual has examples in figure 2, sheets 1 and 2, on how to incorporate paper changes.

CD-ROMs pose a different challenge because you first must identify all the publications on the disk. New librarians often are not aware that publications are

on CD-ROM or even in their library, making this area a great place to start. Once you've identified all your publications on CD-ROM, stick an adhesive label on the CD-ROM case, and mark the label with the applicable NavAir publication numbers and the IRAC number. Don't forget to stamp the CD-ROM with a proper CTPL publication stamp, signifying whether other copies exist and identifying their location. This step is no different than a paper publication, except it is marked on a disk.

The IRAC that affects a publication on CD-ROM must be placed in a binder or folder to offer easy access to the people who will use the disk. That IRAC remains on file until you receive an updated CD-ROM with the change incorporated. As a general rule, I recommend placing a locator sheet in front of the CD-ROM case to tell people about the IRACs to affected pubs. That sheet should also point to the IRAC file or folder.

I understand many communities have specific

local procedures on how to maintain and update CD-ROMs. I recommend the CTPL contact their wing or MALS for help on any local procedures. Another source for help is your local technical-publication specialist. A list with closest office can be found in NavAir 00-25-100.

*SSgt. Jones is a maintenance analyst at the Naval Safety Center.*



These maintainers follow the book even on the simplest task.



# ORDNANCE

## Understanding the Notice of Ammunition Reclassification (NAR) Program

By MSgt. Claude Ready

When referring to the relationship between the United States and the Soviet Union, President Ronald Reagan said, "Trust but verify." That advice also is good for those of us who are tasked with loading, handling, installing, and testing explosive systems. The Navy and Marine Corps give us numerous tools and various publications to help us. One of the best items available is the NAR.

This program provides a standardized method to inform all Navy and Coast Guard activities of condition-code changes and methods to dispose of unsafe or unreliable ordnance items. We gain this knowledge through rapid, worldwide dissemination of NAR messages. The NARs also can be used as an inventory-management tool to place usage restrictions or priorities on certain items. This document is applicable to all cognizance symbols (COGs) of conventional naval ordnance, including Marine Corps ground ammunition.

The NavAmmoLogCen in Mechanicsburg, Pa., is responsible for maintaining and managing the NAR, but they do not initiate the NAR action. Navy acquisition and program managers and the MarCorSysCom—or their designated agents—determine the need for a NAR on a specific ordnance item, and they then forward a NAR request to NavAmmoLogCen. Once a NAR is issued, each activity with identified assets is required to follow the designated action.

How do you know if a NAR has been issued? Every NAR, ammunition information notice, and overhead fire clearance or restriction is listed in NavSup P-801/TW024-AA-ORD-010, *Ammunition Unserviceable, Suspended and Limited Use*, which is published semi-annually.

Fleet Support Teams (FSTs) determine the need for a NAR, based on mishap and deficiency-malfunction reports. This point is critical because all accidents, incidents and unsatisfactory performance of non-nuclear ordnance and materials must be reported.

I often find Navy and Marine Corps aviation units are not using the NAR properly, or they lack the training to implement it effectively. Too often, we assume our shipmates always are on top of their game, and we have faith that station weapons will catch any problem before the ordnance reaches the

flight line. That approach would be great in a perfect world, but no one is immune from error.

Our database is rife with "trust related injuries." One recent example was an AO1 who was re-stowing prac-

tice bombs. He trusted a shipmate, did not verify the ordnance, and ended up with his face blown open [See the story "Almost Killed by a Practice Bomb" in the spring 2002 issue, or on our website at [www.safetycenter.navy.mil/media](http://www.safetycenter.navy.mil/media).—Ed.]. That Sailor believed a fellow ordie had removed the signal cartridge from a BDU-33.

This type of problem can happen in any job, especially one that has become routine. Our brain is the greatest tool available, and we have to use it. We have to train our people to be more proficient at their job, and we must take time to reenforce what already has been taught. We must trust our fellow ordies but also must verify their actions.

MSgt. Ready is a weapons analyst at the Naval Safety Center.



Photograph by PHAA Lance H. Mayhew Jr.



For more info...

OpNavInst 5102.1C (with interim changes 2-5), OpNavInst 5100.19D, and MCO 8025.1 provide procedures for reporting accidents, incidents and unsatisfactory performance of non-nuclear ordnance and materials. They also provide supporting information about the NAR.

## Sewing Machine Discrepancies

By AMEC(AW) Mike Cant

During numerous visits, I have found only a few fleet maintainers who consider sewing-machine lubrication oil as hazmat. When I check the authorized user's list (AUL) in most PR shops, that oil is not listed. When an item is not listed on the AUL, this usually means a material safety data sheet (MSDS) is not available. Without that document, squadrons illegally are using hazmat because the emergency data contained in the MSDS is critical.

Our teams usually find about four unlabeled items per squadron. I receive interesting answers when I ask for the sewing-machine oil, "Oh, we just ran out of oil a couple of weeks ago." That answer means a squadron is not doing pre-op inspections on the sewing machine. Of course, I usually find an oil container in the shop. Some supervisors say, "We check out the oil from the hazmat coordinator," but a quick look at the hazmat log disproves that story. These little white fibs give me an uneasy feeling, and I begin to wonder why the shop would lie, when I am here to help save them thousands of dollars in fines.

Most LPOs are honest. I ask for the sewing-machine oil, and, nine times out of 10, they show me a little white bottle of oil that came with the

sewing machine. The problem with this bottle is it doesn't have a hazmat label (DD Form 2522 can be found on the HMIS CD ROM and can be sized down on a copier to fit the bottle). An unlabeled hazmat container can lead to a hefty fine and to other penalties. Adding the oil to the AUL is easy, and I recommend using the half-ounce tube of VVL-800 (NSN 9150-00-836-8641) because it is available through the supply system, and the tube has a hazmat label. Pay particular attention to unit of issue: 55 gallon, 5 gallon, one gallon, or half-ounce tube.

One problem I often find with sewing machines is missing belt guards and needle guards. New sewing machines will not have these guards installed, meaning the shop must order them.

I also find that eye-hazard signs are not posted near the sewing machine, and eye protection often is not used—even when it is available.

*Chief Cant is a maintenance analyst at the Naval Safety Center.*



*For more info...*

*Contact the Consew company at (212) 741-7788 about needle and belt guards for sewing machine model no. 206RB-4. Your supply department can do an open purchase for a needle guard (P/N: 10937, cost: \$13.75) and a belt guard (P/N: 15098C, cost \$43.45).*

## Stearns Mk-1 Float Coat Hits the Fleet

By PRCS(AW) Joe Revard

The Mk-1 float coat has a new manufacturer: Stearns, Inc. The new float coat has a few features that make it more beneficial for Sailors, and its improved floatation meets Coast Guard requirements.

New features include Velcro closures on all pockets, covered auto-inflation assembly and oral inflation assembly, heavy-duty zipper to keep the vest from opening, a one-inch adjustable waist belt to keep the vest from becoming a snag hazard, and an opening in the back to allow the D-ring of the safety harness to fit through. The chemical pill or battery-operated inflation assembly, which is used today, is unchanged.

You can order a complete assembly or individual components. The complete assembly comes "ready to wear." You'll receive the coat, an inflatable chamber, a strobe light with a tether line and a Velcro patch, a whistle with tether line, a Secumatic 301 chemical-pill inflation assembly, and one 24-gram CO<sub>2</sub> bottle.

The new coat is more durable, but you will notice the vest's fabric has a heavier "feel." A full variety of colors are available, but you may find the brown float coat a little odd because of the shiny look and different shade.

If you need the PMS and MRC deck for this item, contact Mark Campbell (NavSea 05P6—damage control and fire protection) at 202-781-3619 (DSN 326) or e-mail at [campbellmr@navsea.navy.mil](mailto:campbellmr@navsea.navy.mil).

*Senior Chief Revard is a maintenance analyst at the Naval Safety Center.*



## One Size Fits All

By PRCS(AW) Joe Revard

I frequently visit squadrons that have received the LPU-32/P—the authorized replacement for the Mk-1 float coat for aircraft passengers. This gear is to be worn by passengers and troops in helicopter and transport aircraft. The new flotation device will improve sea-survival odds of each passenger. This gear is designed so one size fits all and will replace the occasionally ill-fitting Mk-1 float coat.

Senior Chief Revard is a maintenance analyst at the Naval Safety Center.



For more info...

NavAir 13-1-6.1-2, Chapter 25, provides information that describes the configuration, application and function of this new gear.



Photograph by Matthew J. Thomas

## MAINTENANCE MANAGEMENT

### Class C Mishap Summary

By AMCS(AW) Steve Novak

From Oct. 22, 2002 to Feb. 18, 2003, the Navy had 34 Class C's that involved 42 aircraft. The damage total was \$1,766,698.

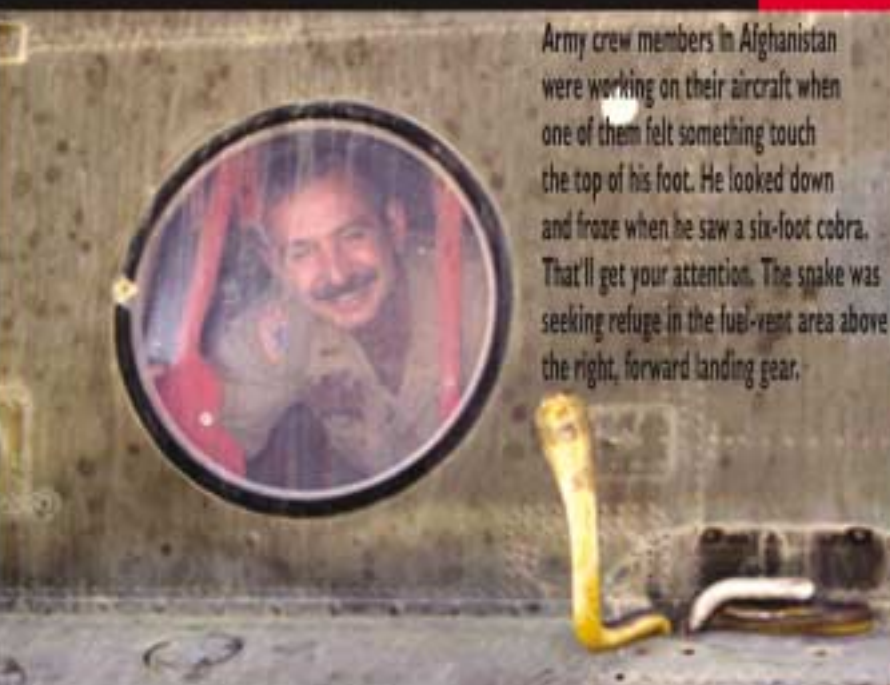
✎ A T-44A aircraft was blown off jacks during a severe thunderstorm. The third shift's maintenance-control coordinator was told of approaching thunderstorms at 0405L. He ordered maintainers to close the doors of one hangar and then realized another hangar housed an aircraft that was on jacks. He knew those doors needed to be secured. By this time, the storm was upon them, and the weather prevented anyone from going outside to the other hangar. The coordinator told maintainers to get a vehicle and to go to the hangar. The wind gusts were peaking at 60 knots, and, when the maintainers arrived at the hangar, the aircraft already had been blown off the jacks. The aircraft's fuselage, right horizontal stabilizer, rudder, and rudder trim tab were damaged. That mishap cost \$20,000.

✎ An FA-18C aircraft's trailing-edge flap was damaged when aircraft door 45R departed the aircraft in flight. The pilot entered the FCLP pat-

tern and did eight FCLP landings and one full-stop landing. He then taxied the to the line, shut down the aircraft, and found the door missing. Contributing causes of this incident included failure to accurately document in-work maintenance for panels 45L and 45R (the panel had been "tacked" on, panel 45R did not have the correct number of fasteners, line personnel failed to report a bag of fasteners they had found during a 14-day inspection, and aircrew did not do a proper preflight). The cost of this incident was \$25,665.

✎ An F-18C aircraft engine ingested an intake-cover pin during a low-power turn. The engine-turn screens temporarily had been stowed beneath an aircraft parked in the hangar bay. This aircraft was moved, and the crew decided to put the screens inside the intakes because of a scheduled low-power turn within 24 hours. The pin had come loose and wasn't seen. It was ingested into the engine, resulting in \$25,558 worth of damage. In addition to the bad decision on stowing the screen, other personnel did not take corrective action after seeing the intake cover inside the intake. The low-power turn-up maintainer didn't dive the duct before the turn, and squadron personnel didn't communicate with each other.

Senior Chief Novak is a maintenance analyst at the Naval Safety Center.



Army crew members in Afghanistan were working on their aircraft when one of them felt something touch the top of his foot. He looked down and froze when he saw a six-foot cobra. That'll get your attention. The snake was seeking refuge in the fuel-vent area above the right, forward landing gear.



# Before You deploy, learn about the locals and their habits.

## Check your work space for hidden dangers.

Poster idea contributed by SSgt. John W. Jackson, 363 TRS/TTW  
and Troy Armstead, Pentagon Safety Office, 11th Fighter Wing  
Visit the Naval Safety Center website at [www.safetycenter.navy.mil](http://www.safetycenter.navy.mil)

